

**FIVE-YEAR REVIEW REPORT
NORTHSIDE LANDFILL SUPERFUND SITE
ZIONSVILLE, INDIANA
SEPTEMBER, 1999**

I. INTRODUCTION

Section 121(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by SARA and Section 300.430(f)(4)(ii) of the National Contingency Plan (NCP), require that periodic (no less often than five years) reviews are to be conducted for sites where hazardous substances, pollutants or contaminants remain at the site above levels that will not allow for unlimited use or unrestricted exposure following the completion of all remedial actions for the site. The purpose of such a review is to assess whether the remedial actions implemented continue to be protective of human health and the environment. This review focuses on the protectiveness of the Northside Landfill Superfund Site located in Zionsville, Indiana.

The United States Environmental Protection Agency (U.S. EPA) has established a three-tier approach (with a sub-tier Level Ia) to conducting Five-Year Reviews, the most basic of which provides a minimum protectiveness evaluation (Level Ia review). U.S. EPA contemplates that a Level I review will be appropriate in all but relatively few cases where site-specific considerations suggest otherwise. The second and third levels (Level II and Level III) of review are intended to provide the flexibility to respond to varying site-specific considerations, employing further analysis. Site-specific considerations, including the nature of the response action, the status of on-site response activities, and the proximity to populated areas and sensitive environmental areas determine the level of review for a given site. A Level I review is being conducted for the Northside Landfill Superfund Site.

OSWER Directives 9355.7-02 (Structure and Components of Five-Year Reviews, May 23, 1991), 9355.7-02A (Supplemental Five-Year Review Guidance, July 26, 1994) and 9355.7-03A (Supplemental Five-Year Review Guidance, December 21, 1995) provide that U.S. EPA will conduct Five-Year Reviews as a matter of policy (Policy Review) at sites where no hazardous substances will remain above levels that allow unlimited use and unrestricted exposure after completion of a remedial action, but the remedial action goals specified in a Record of Decision (ROD), will require five or more years to attain, e.g. long-term response action sites (LTRA). The ROD and ROD Amendment at the Northside Landfill Superfund Site established soil containment and groundwater clean-up standards which would allow for eventual unlimited use of groundwater and surface water at and beyond the Northside Landfill Site boundary. To date, groundwater and surface water standards have been achieved beyond the Site fence line, but not on the Site property surrounding the hazardous waste landfill. As a result, remedial action monitoring continues even though no active groundwater remedy is required.

The Northside Landfill Site Group has conducted the remedial action at the Superfund Site in accordance with the ROD (signed September, 1987), ROD Amendment (signed July, 1991) and Remedial Design(RD)/Remedial Action(RA) Consent Decree(CD) (entered November, 1991). The remedial action selected for restoration at the Site is effective and protective of human health and the environment.

II. SITE HISTORY AND CONDITIONS

Background

The Northside Landfill Superfund Site (NSL) is a privately owned 181 acre property in which the landfill occupies approximately 65 acres. The Site is located on the east side of U.S. 421 approximately 8 miles northwest of the intersection of U.S. 421 with Interstate 465, and one mile south of the junction of U.S. 421 and State Route 32. The nearest town is Zionsville, Indiana which is about six miles south of NSL.

It appears from area photos that landfill operations began sometime between 1955 and 1962. Beginning in the early 1970's, Indiana inspectors began to document numerous operational deficiencies including failure to cover refuse, surface burning, underground fires and unapproved disposal of wastes. Unapproved wastes included paint sludges, waste oils, acids and spent acids. NSL applied to USEPA to operate as a hazardous waste landfill in 1980. By 1981 NSL had already accepted at least 16 million gallons of hazardous substances. A number of violation notices, compliance agreements and orders were issued to NSL the next few years until a Record of Decision was signed in 1987. Because of continuing violations and disagreements between the agencies and NSL, a ROD amendment was issued in 1991 before the NSL responsible parties agreed to a RD/RA Consent Decree later that year. The primary reason for the 1991 ROD amendment was to reflect the decision to separate the remedial activities at NSL from the adjacent Environmental Conservation and Chemical Corporation Site (ECC). Therefore, ECC activities were included in the 1987 ROD for NSL but not in the 1991 ROD amendment or 1991 Consent Decree.

Remedial Planning Activities

Remedial planning began at NSL as the Site was proposed for the National Priorities List on September 8, 1983. The Site became a final NPL listing on September 21, 1984. A remedial investigation was carried out from February 1984 to September 1987. The significant results of the RI at the NSL Site included:

* The hydrogeologic pathways below NSL involve a zone of glacial till with sand and gravel lenses just below the surface. A confining layer separates this pathway from a deeper aquifer containing sand and gravel.

* Groundwater directly below NSL generally travels south and discharges into Finley Creek just south of the Site. It also discharges at times into an unnamed ditch just west of the Site. There is no known off-site groundwater contamination. Because these surface waters are discharge areas for the on-site groundwater, it is difficult to separate the two when analyzing contamination at NSL.

* In the glacial till area, contamination was found on all sides of the landfill. Analysis of the groundwater revealed volatiles such as trichloroethene, semi-volatiles, pesticides and inorganics.

* Finley Creek and the unnamed ditch receive contaminants from NSL through surface water runoff and groundwater migration. Contaminants in the surface water may volatilize, degrade, precipitate or absorb to sediments, or remain in solution and be transported downstream to Eagle Creek.

* Leachate often infiltrates through the contaminated soil and debris migrating into the glacial till layer of the groundwater. Leachate also seeps from the side slopes of the landfill and discharges to the unnamed ditch and Finley Creek.

* Soil samples were not taken below the landfill area but samples taken in the subsurface around the landfill indicated several areas of contamination. Potential future erosion of the landfill surface could result in exposure and migration of contaminants within the landfill.

The 1987 ROD and 1991 ROD amendment prepared by USEPA and IDEM listed the remediation goals for the NSL Site. These goals included minimizing risk to public health and environment from direct contact, inhalation or ingestion of NSL contaminants; controlling groundwater to minimize off-site migration of contamination resulting from NSL seeps; minimizing NSL leachate seeps to off-site groundwater and surface water pathways; controlling and eliminating contamination in surface water discharges; and implementing access restrictions at the NSL site property.

III. SUMMARY OF RESPONSE ACTIONS

The components of the remedial action listed in the NSL 1987 ROD and 1991 ROD amendment include a RCRA hazardous waste performance cap with gas venting; a hydraulic isolation wall on the south and west sides of the landfill; a combined leachate/on-site groundwater collection system; a transfer station for collection and storage of leachate/on-site groundwater to be trucked for disposal to an off-site treatment plant; access restrictions; and a groundwater and leachate monitoring program.

* The landfill cap was constructed so as to minimize the infiltration of precipitation into the landfill while encasing the waste materials. The cover system consists of a multi-layered soil cap designed to meet RCRA performance criteria for closure of a Subtitle C, Hazardous Waste

Landfill. From bottom to top the layers of the cap include a soil barrier layer; a synthetic drainage composite layer on the side slopes and 12-inch sand drainage layer with filter fabric on slopes less than 9 percent grade; general fill; and seeded top soil. The cap was designed to meet a minimum soil barrier layer permeability of 1×10^{-7} cm/sec.

The landfill cap venting system was constructed to provide for the passive venting of gasses generated by natural degradation of landfill wastes. The system consists of three gas collection trenches installed beneath the cover system and five vertical well vents through the cover to provide controlled gas release to the atmosphere. Liquids and gasses present within the landfill can be monitored using the monitoring access ports included with each gas well vent.

The landfill storm water control system is based on a 25-year 24-hour storm event. Terraces and discharge flumes have been designed to effectively control the flow of storm water from the landfill surface to the base of the landfill. A drainage ditch along the eastern and northern landfill toe has been constructed to direct water flow to Finley Creek and Unnamed Ditch on the southern and western sides of the landfill.

* The hydraulic isolation wall was constructed along the southern and western boundaries of the landfill and is designed to isolate the upgradient leachate/on-site ground water collection system from adjacent surface-water influences; serve as a secondary containment barrier to minimize movement of ground water away from the Site; and minimize any potential back-flow of groundwater derived from Finley Creek into the landfill area. The design permeability for the hydraulic isolation wall of 1×10^{-7} cm/sec is based on the permeability of the landfill cap. The wall is a minimum of 3 feet thick and is deep enough to ensure it is below the shallow surface sand lenses of the aquifer as well as the adjacent Finley Creek depth.

* The combined leachate/on-site groundwater collection system includes a shallower trench system for leachate collection on the north, northwest and east sides of the landfill, and a deeper trench system for combined leachate/on-site groundwater collection on the south and west sides of the landfill. The shallow trench system was constructed 0 to 5 feet into the native soils above the natural groundwater table to remove leachate at the landfill perimeter. A vertical sump has also been installed in the northeast corner of the waste area to facilitate periodic leachate removal. The deeper system on the south and west sides of the landfill was installed to depths up 17 feet to intercept and collect groundwater passing underneath the fill area as well as any leachate. The leachate/on-site groundwater collection system is designed to gravity drain to a collection sump and lift station located in the southwest corner of the landfill.

* The transfer station for collection, storage and off-site disposal of leachate/on-site groundwater begins at a sump with 800 gallons of storage capacity and a base that extends approximately 25 feet below ground surface. A submersible pump is installed in the sump to transfer the liquids to an above-ground 30,000 gallon storage tank. The storage tank sits in a transfer station building at the southwest corner of the Site that will allow for tanker trucks to periodically load the liquids and then dispose of them at an off-site treatment plant.

* Access restrictions have been imposed to eliminate direct access to the Site, and to control both future development on the Site as well as use of groundwater discharged from the Site. Direct access is prevented by a permanent fence installed around the landfill property. Future development and groundwater use controls were accomplished by imposing deed restrictions for the parcels of property involved.

A Consent Decree was entered in the Southern District Court of Indiana in November 1991. Under this Consent Decree, a group of Responsible Parties agreed to conduct the remedial design (RD) and complete the remedial action (RA) at the Northside Landfill Site.

IV. REMEDIAL OBJECTIVES

Remedial objectives at the Northside Landfill Superfund Site include the elimination of any excess soil ingestion, inhalation, direct contact or groundwater leachate human health risks by containment and treatment of contaminated soils and sediments. Groundwater and surface water remedial objectives are the attainment of primary and secondary maximum drinking water contaminant levels (MCLs), and the elimination of any excess life-time cancer risk.

Excess human health risks due to contaminated soils and sediments are being addressed by the soil remedy at the Site. The RCRA hazardous waste performance cap completed in 1996 provides adequate containment of the on-site soil contamination. The landfill cap venting system allows for gasses which degrade naturally from the landfill to be emitted to the atmosphere. Soil containment and treatment operations at the Northside Landfill hazardous waste landfill cap are outlined in the Site Operation and Maintenance Plan.

The Site hydraulic isolation wall, leachate/on-site groundwater collection system and storage tank have been in place since 1996. The leachate/on-site groundwater collection system is monitored and periodically pumped in order to maintain an inward gradient across the Site hydraulic isolation wall. The leachate/groundwater is then trucked from the storage tank to an off-site treatment works facility. Recent monitoring has shown that volatile contaminant levels and risks are at or below groundwater clean-up standards, although certain inorganic compounds remain above clean-up objectives outlined in the 1991 ROD amendment and 1991 CD.

V. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

Five-Year Review guidance establishes policy for the U.S. EPA to review and analyze the remedial action as it is affected by newly promulgated or modified Federal and State environmental laws. ARARs listed in the ROD and ROD amendment pertaining to groundwater remediation, soil remediation and air emissions at the Northside Landfill Superfund Site remain essentially unchanged and are still considered relevant and appropriate.

Groundwater/leachate that is trucked off-site from Northside Landfill is currently handled by Heritage Environmental. The containerized groundwater/leachate is required to be batch sampled under Toxicity Characteristic Leaching Procedures (TCLP) parameters. To date, all batches of groundwater/leachate have been non-hazardous.

VI. SUMMARY OF SITE VISITS

The Northside Landfill Superfund Site has been visited several times during the operation and maintenance period. The most recent visit and inspection was August 17, 1999. During the visit the Site hazardous waste cap and Site groundwater/leachate storage building were properly maintained. In addition, the groundwater monitoring wells were properly capped and locked, and the Site security fence was intact and locked.

VII. AREAS OF NONCOMPLIANCE

The remedy selected in the ROD has been implemented and remains functional, operational and effective. As long as the Northside Landfill Group contractors continue to maintain and monitor the Site hazardous waste cap and groundwater containment system, the remedy should contain the soil contamination and ensure that no surface water contamination or groundwater plume develop. The RCRA Subtitle C compliant hazardous waste cap and Site security fence insure that source area contamination is contained, and a permanent barrier exists to prevent human contact. Although no off-site groundwater plume exists, on-site groundwater monitoring wells with inorganic levels above clean-up objectives listed in the ROD amendment and CD Statement of Work prevent the Superfund remedial action from being completed.

VIII. RECOMMENDATIONS/TECHNOLOGY

U.S. EPA recommends that the Northside Landfill Group continue to maintain and monitor the hazardous waste cap, hydraulic containment wall, groundwater/leachate collection and storage system, and groundwater monitoring network at the Site in order to assure that contaminants are contained. Groundwater/leachate should be trucked off-site and disposed as needed to ensure that an inward gradient is maintained across the hydraulic isolation wall. Semi-annual and annual groundwater monitoring sampling, groundwater/leachate batch sampling, cap maintenance and gas vent sampling should continue to assure that the system is operating properly and the remedy remains operational and functional. Current and future monitoring well sampling data should be analyzed to determine if the exceedences of certain inorganic compounds above clean-up standards are a result of natural conditions at the Site or some on-site contamination. This concern over inorganics such as arsenic, iron, chromium VI and lead exceeding Site clean-up standards is the primary factor that needs to be addressed before the Superfund remedial action can be completed at Northside Landfill.

IX. STATEMENT ON PROTECTIVENESS

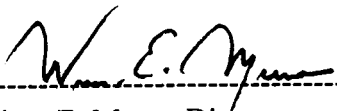
Closure and post closure maintenance of the Northside Landfill Site RCRA Subtitle C cap continues to provide adequate protection of human health and the environment. The hydraulic isolation wall, groundwater/leachate collection system and Site monitoring network combined with Site access restrictions and a security fence provide adequate protection to human health and the environment.

X. NEXT REVIEW

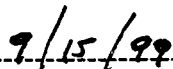
If hazardous substances, pollutants or contaminants remain above Site remedial action standards in the on-site monitoring wells, Northside Landfill will remain a Superfund National Priorities List (NPL) Site and require another U.S. EPA Five-Year Review during fiscal year 2004. Restrictions on Site land and on-site groundwater use will continue to remain at Northside Landfill.

XI. IMPLEMENTATION REQUIREMENTS

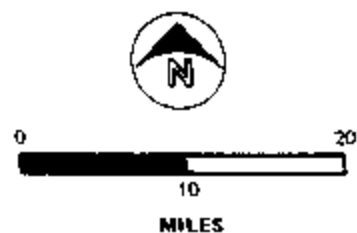
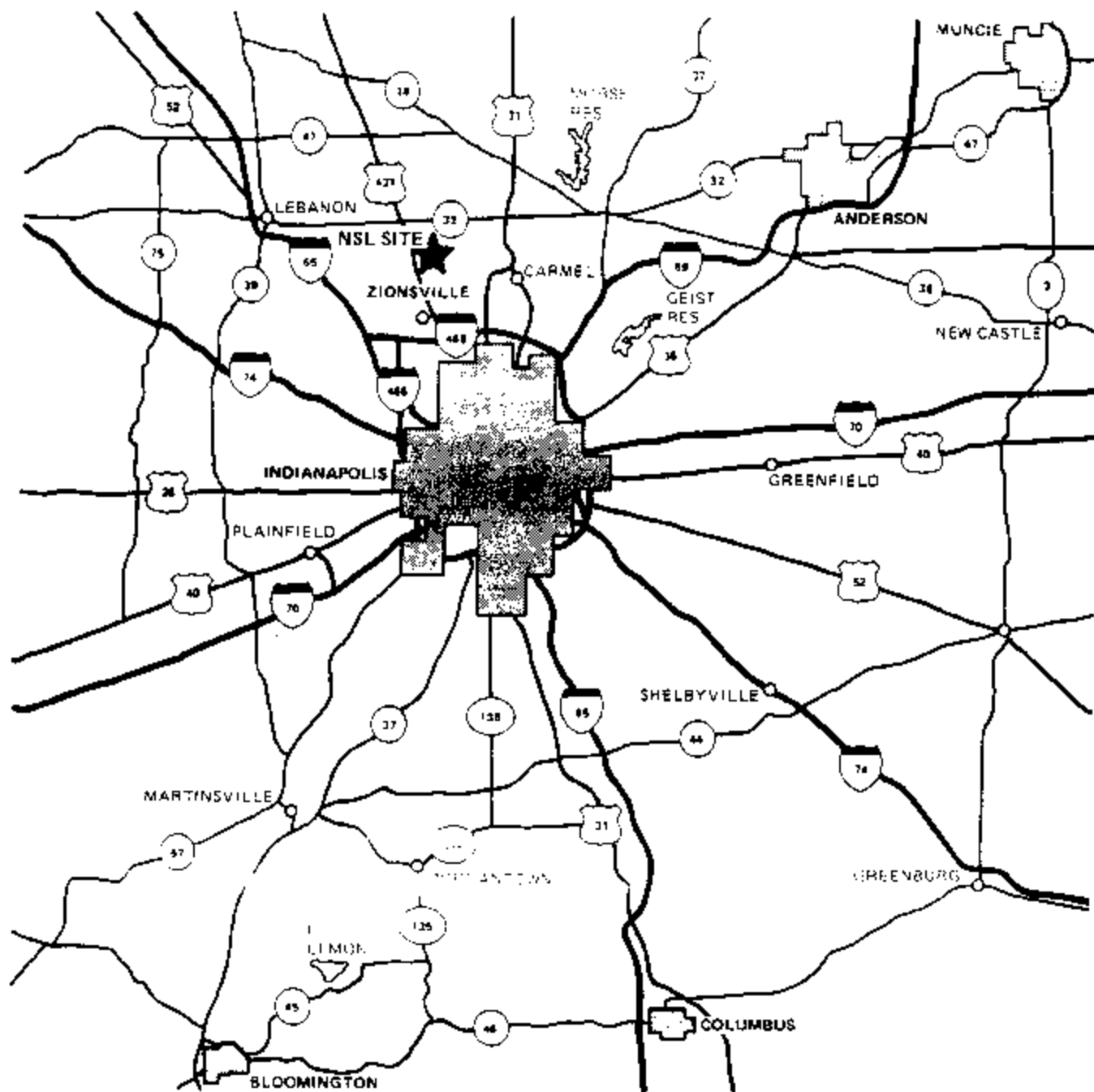
Prior to the next Five-Year Review, the above mentioned recommendations should be implemented and maintained.



William E. Munro, Director
Superfund Division



Date



LOCATION MAP
NSL FS

